Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/SE05/000462

International filing date: 31 March 2005 (31.03.2005)

Document type: Certified copy of priority document

Document details: Country/Office: SE
Number: 0400875-1
Filing date: 01 April 2004 (01.04.2004)

Date of receipt at the International Bureau: 15 April 2005 (15.04.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

PCT / SE 2005 / 0 0 0 4 6 2

PRV

PATENT- OCH REGISTRERINGSVERKET
Patentavdelningen

Intyg
Certificate

Härmed intygas att bifogade kopior överensstämmer med de handlingar som ursprungligen ingivits till Patent- och registreringsverket i nedannämnda ansökan.

This is to certify that the annexed is a true copy of the documents as originally filed with the Patent- and Registration Office in connection with the following patent application.

PATENT- OCH REGISTRERINGSVERKET • PATENT- AND REGISTRATION OFFICE

(71) *Sökande* *Obigo AB, Lund SE*
Applicant (s)

(21) *Patentansökningsnummer* *0400875-1*
Patent application number

(86) *Ingivningsdatum* *2004-04-01*
Date of filing

Stockholm, 2005-04-06

För Patent- och registreringsverket
For the Patent- and Registration Office

Gunilla Larsson

Avgift
Fee

PATENT- OCH REGISTRERINGSVERKET
SWEDEN

Postadress/Adress
Box 5055
S-102 42 STOCKHOLM

Telefon/Phone
+46 8 782 25 00
Vx 08-782 25 00

Telex
17978
PATOREG S

Telefax
+46 8 666 02 86
08-666 02 86

A TERMINAL FOR NAVIGATING DOCUMENTS

Technical Field

The present invention relates to a terminal for navigating documents, comprising browser means, pointer means arranged to be controlled by a terminal user, a small-size display, and display means arranged to display a portion of a large-size document on the small-size display, the area of the complete large-size document being larger than the area of the small-size display.

Background of the Invention

Mobile communication terminals such as mobile phones are becoming more powerful making it possible to process the same amount of data with a mobile phone as with a traditional PC. Instead of just displaying short text messages via SMS containing only a couple of hundreds of characters, the mobile phones of today can display word processing documents, spreadsheets, large web pages etc. However, even though the mobile phones can process a large amount of data, the size of the display of the mobile phones is limited making it hard for the user to overview and find information in large-size documents. When browsing a large web page, for example, on a small-size display, it is hard to find a specific spot in the web page. Further, if the user has scrolled for a while in the web page, it is hard for the user to keep track on his position in the web page.

These problems also exist for so called smart mobile phones. These smart mobile phones have larger displays compared to traditional mobile phones. The display is usually a touch screen, and the user uses a stylus to tap on the touch screen in more or less the same manner as a mouse is used on a PC. These smart mobile phones are powerful, i.e. having large memory and powerful processors, and therefore it is possible to load the same web pages into the web browser on the mobile phone as is loaded into the web browser in a PC. However, although the display on smart mobile phones is large compared to traditional mobile phones, the display is still regarded as small when browsing conventional web pages. It is hard to navigate around on the web page and get an overview of the entire web page.

Therefore, there is a need for a technique which gives the user a good overview of a large-size document, and at the same time makes it possible to navigate and scroll easily to any position in the large-size document. Further, it is

desirable that said technique does not result in a big change of the original way to display a large-size document.

US 6 466 203 B2 discloses a handheld communication device provided with a display with touch screen, the device having a browser and is capable of retrieving a web page from the Internet. The web page is first displayed in its entirety. The user can recognize the web page's general lay out and presence of hyperlinks. When the user touches a particular location on the touch screen that corresponds to a portion of the web page's image, the portion gets displayed so as to fill the display's area. Thus, the user can browse a web page with a display of limited size.

US 2003/0137522 A1 discloses how web pages are displayed with a simultaneous overview and magnified view. An indicator can show the portion of the overview in the magnified view. Both views can be shown, one above the other, across the full width of the same screen. A user can select between such a split view and another view, including an overview, a magnified-only view, and a view in which selected text is laid out to fit the width of the magnified view.

US 6 590 583 B2 discloses a method for digital image magnification in a graphical user interface. The method provides a method for magnification that allows simultaneous viewing of the magnified image and its unmagnified context. The method provides a floating window superimposed on the original image. Displayed within the floating window is a magnified image of a selected region of the original image. In one aspect of the method the floating window is transparent.

WO 03/034342 A1 discloses a magnifying tool enlarging a selected region of displayed image surrounding a cursor in a graphical user interface, and superimposes the enlarged region directly over the selected region. The location of the cursor relative to the enlarged region is co-located with the location of the cursor relative to the selected region such that the locations are identical.

US 2002/0143826 A1 discloses a web browser which magnifies the content of the whole web page in a memory and displays the relevant portion in a magnifier with hyperlinks. The browser then maps the magnified display to the original document. Thus, manipulation of the mouse in the magnified display may result in an action with respect to the original document. The user may then select a link for navigation within the magnified display.

WO 02/082418 A2 discloses a method for the display of standardised pages, generated for display on large-size screen, on a small display on handheld devices. A virtual large image memory is maintained in the device. Within the large virtual image the device display can be freely displayed as a readable image section. A zoom function permits an overview and coarse positioning of the detailed representation. The detailed representation can be continuously moved around within the virtual image in the form of a screen section by means of a pointer device by moving the pointer to the display edge. Switch can be performed at any time between the display modes.

However, above mentioned devices and methods do not provide a satisfactory way to browse large-size documents on a handheld communication terminal with a small-size display which provides a good overview of the entire large-size document and at the same time makes it possible to navigate and scroll easily to any position in said large-size document.

The Object of the Invention

The object of the present invention is to provide a device having a small-size display, providing a good overview of a large-size document which is too large to be displayed in its entirety on the small-size display, and a user-friendly method of navigation of large-size documents.

Summary of the Invention

The above mentioned object is achieved by providing a terminal which provides a radical improvement of navigating documents by a terminal of the kind defined in the preamble of claim 1, comprising the special features that the terminal comprises control means arranged to form a miniature copy of the complete large-size document browsed by the browser means, and that the display means are arranged to display the miniature copy on the small-size display or screen in the form of a miniature field. Preferably, the miniature field is movable on the small-size display and is superimposed on the displayed portion of the large-size document. With this terminal according to the present invention a good overview of large-size documents is provided enabling for the terminal user to see his current position in the large-size document being browsed. The browser means of the terminal according to the present invention can be any kind of browser capable of

browsing large-size documents, e.g. a browser using the method Smart Rendering.

According to an advantageous embodiment of the terminal according to the present invention, the display means are arranged to display the miniature copy in such a way that the ratio between the width and height of the miniature copy is equal to the ratio between the width and height of the complete large-size document.

According to a further advantageous embodiment of the terminal according to the present invention, the pointer means are arranged to point at any position in the miniature field, that the control means are arranged to register the position pointed by the pointer means, and that the display means are arranged to display on the small-size display the position in the large-size document corresponding to the position pointed by the pointer means. The pointer means can comprise a stylus combined with a touch screen, or a joystick, scroll wheel or the like. With this embodiment an effective and user-friendly method of navigation of a large-size document is provided. Preferably, the size of the miniature field is adjustable.

According to another advantageous embodiment of the terminal according to the present invention, the miniature field is scrollable.

According to an advantageous embodiment of the terminal according to the present invention, the control means are arranged to position a displayed position field in the miniature field in such a way that the position of the position field in the miniature copy corresponds to the position of the displayed portion of the large-size document in said large-size document, i.e. the position field is positioned in the miniature copy as the displayed portion of the large-size document is positioned in said large-size document. The position field is displayed in such a way that it is contrasting to the miniature field, for example having a certain colour. This embodiment of the terminal enables for the user to see his precise current position in the large-size document being browsed. Preferably, the display means are arranged to display the position field in such a way that the ratio between the width and height of the position field is equal to the ratio between the width and height of the displayed portion of the large-size document.

According to a further advantageous embodiment of the terminal according to the present invention, the control means are arranged to move the position field to any other position in the miniature copy by means of the pointer means,

that the control means are arranged to register the new position of the position field, and that the display means are arranged to display on the small-size display the portion of the large-size document corresponding to the new position of the position field. With these further features of this embodiment an even more effective and user-friendly method of navigation of a large-size document is provided.

According to another advantageous embodiment of the terminal according to the present invention, the display means are arranged to display the miniature field and position field, respectively, on the small-size display with different transparency levels. This feature allows for the user to be able see through the miniature field and view the whole displayed portion of the large-size document. Preferably, the display means are arranged to display the portion of the large-size document on the small-size display in such a way that the area of said displayed portion is equal or almost equal to the area of the small-size display.

According to yet another advantageous embodiment of the terminal according to the present invention, the small-size display is a touch screen. Preferably, the terminal is a telecommunication device, preferably handheld, for example a mobile phone, and the browser means of the terminal according to the invention are arranged to browse web pages on Internet, or any type of documents, for example word processing documents, spreadsheets, web pages, web documents, large images etc.

Brief Description of the Drawings

The present invention will now be described, for exemplary purposes, in more details by way of embodiments and with reference to the enclosed drawings, in which:

Fig. 1 is a schematic view of a terminal according to the present invention, and

Fig. 2 is a schematic view of the positioning of the position field and miniature field in relation to the displayed portion of a large-size document and said large-size document.

Detailed Description of Embodiments

Fig. 1 shows a handheld telecommunication terminal for navigating documents according to the present invention, comprising browser means 1, pointer means 2 arranged to be controlled by a terminal user, a small-size display 3 with

touch screen, and display means 4 arranged to display a portion of a large-size document on the small-size display 3, the area of said displayed portion being equal to the area of the small-size display 3, and the area of the complete large-size document being larger than the area of the small-size display 3. The terminal comprises control means 5 arranged to form a miniature copy of the complete large-size document browsed by the browser means 1, and the display means 4 are arranged to display the miniature copy on the small-size display 3 in the form of a movable size-adjustable miniature field 6. Further, the control means 5 are arranged to position a displayed position field 7 in the miniature field 6 in such a way that the position of the position field 7 in the miniature copy corresponds to the position of the displayed portion of the large-size document in said large-size document, the display means 4 being arranged to display the position field 7 in such a way that the position field 7 is contrasting to the miniature field 6. The display means 4 are arranged to display the miniature field 6 and position field 7, respectively, on the small-size display 3 with different transparency levels, and the display means 4 are arranged to display the miniature copy in such a way that the ratio between the width and height of the miniature copy is equal to the ratio between the width and height of the complete large-size document. Further, the miniature field 6 is scrollable. The miniature field 6 being scrollable is suitable for large-size documents that are very high but not wide, in which case the miniature copy would more or less be a thin line on the small-size display 3, and to avoid this problem the miniature field 6 is scrollable. When the control means 5 form the miniature copy, said control means 5 make the miniature copy at least x pixels wide. By doing so, the miniature copy might become higher than what is appropriate to display and therefore, and instead of displaying the complete miniature copy the miniature field 6 becomes scrollable. The same applies for documents that are very wide and not high.

The terminal is arranged to navigate a large-size document in the two following ways. Firstly, the pointer means 2, comprising a stylus, are arranged to point at any position in the miniature field 6, and the control means 5 are arranged to register the position pointed by the pointer means 2. The display means 4 are arranged to display in the small-size display 3 that position in the large-size document corresponding to the position pointed by the pointer means 2. Secondly, the control means 5 are arranged to move the position field 7 to any other position

within the miniature copy by means of the pointer means 2. The control means 5 are arranged to register the new position of the position field 6, and the display means 4 are arranged to display on the small-size display 3 the portion of the large-size document corresponding to the new position of the position field 6.

Fig. 2 schematically shows how the terminal according to the invention displays a portion of a large-size document, a miniature field displaying the complete miniature copy, and a position field, in relation to each other and to the large-size document itself. Fig. 2 shows a schematic view of a complete large-size document 8, a displayed portion 9 of said large-size document 8 being displayed on the small-size display of the terminal according to the invention, the area of said displayed portion 9 being equal to the area of the small-size display, a displayed miniature field 2.6 in which a complete miniature copy of the complete large-size document is displayed, and a position field 2.7 displayed in the miniature field 2.6 and positioned in such a way that the position of the position field 2.7 in the miniature copy corresponds to the position of the displayed portion 9 of the large-size document 8 in said large-size document 8. The display means of the terminal are arranged to display the miniature copy and position field 2.7 in such a way that the ratio between the width and height of the miniature copy is equal to the ratio between the width and height of the complete large-size document 8, and the ratio between the width and height of the position field 2.7 is equal to the ratio between the width and height of the displayed portion 9 of the large-size document 8.

As mentioned above, the terminal according to the invention provides two different types of navigation. Firstly, the terminal user can navigate to any position in the complete large-size document 8 with only one tap with the stylus in the miniature field 2.6. For example, if the user taps on position X_1,Y_1 in the miniature copy, the browser means will scroll the displayed portion 9 of the large-size document 8 in such a way that the position X_2,Y_2 in the large-size document 8 is displayed in the upper left corner of the displayed portion 9 of the large-size document 8. The relation between X_1,Y_1 and X_2,Y_2 (X_1,Y_1 having its origin in the upper left corner of the miniature copy and X_2,Y_2 having its origin in the upper left corner of the complete large-size document) is:

$$X_2 = \frac{X_1}{width(\text{miniature copy})} * width(\text{large - size document})$$

$$Y_2 = \frac{Y_1}{height(\text{miniature copy})} * height(\text{large - size document})$$

Secondly, the terminal user can navigate by moving the position field 2.7 in a dragging way with the stylus. The position field 2.7 can be moved to any position in the miniature copy. By moving the position field 2.7 x_1Dif,y_1Dif pixels, the displayed portion 9 of the large-size document 8 will be scrolled x_2Dif,y_2Dif pixels. The relation between x_1Dif,y_1Dif and x_2Dif,y_2Dif is:

$$x_2 Dif = \frac{x_1 Dif}{width(\text{miniature copy})} * width(\text{large - size document})$$

$$y_2 Dif = \frac{y_1 Dif}{height(\text{miniature copy})} * height(\text{large - size document})$$

The miniature field 2.6 and the position field 2.7, respectively, can be displayed with different transparency levels. The transparency level can be set by the terminal user and is configurable within the range of no transparency to full transparency. If half transparency is set, the terminal user can see the displayed portion 9 of the large-size document 8 partly through the miniature field 2.6. The miniature field 2.6 can be moved to any place on the small-size display, and can be moved so that most of the area of the miniature field 2.7 is positioned outside the small-size display and hence not visible. The only restriction is that some area of the miniature field 2.6 still is positioned within the small-size display.

CLAIMS

1. A terminal for navigating documents, comprising browser means, pointer means arranged to be controlled by a terminal user, a small-size display, and display means arranged to display a portion of a large-size document on the small-size display, the area of the complete large-size document being larger than the area of the small-size display, **characterized** in that the terminal comprises control means arranged to form a miniature copy of the complete large-size document browsed by the browser means, and that the display means are arranged to display the miniature copy on the small-size display in the form of a miniature field.

2. A terminal according to claim 1, **characterized** in that the display means are arranged to display the miniature copy in such a way that the ratio between the width and height of the miniature copy is equal to the ratio between the width and height of the complete large-size document.

3. A terminal according to claim 1 or 2, **characterized** in that the pointer means are arranged to point at any position in the miniature field, that the control means are arranged to register the position pointed by the pointer means, and that the display means are arranged to display on the small-size display the position in the large-size document corresponding to the position pointed by the pointer means.

4. A terminal according to any of the previous claims, **characterized** in that the miniature field is movable on the small-size display.

5. A terminal according to any of the previous claims, **characterized** in that the display means are arranged to display the miniature field on the small-size display with different transparency levels.

6. A terminal according to any of the previous claims, **characterized** in that the size of the miniature field is adjustable.

7. A terminal according to any of the previous claims, **characterized** in that the miniature field is scrollable.

8. A terminal according to any of the previous claims, **characterized** in that the control means are arranged to position a displayed position field in the miniature field in such a way that the position of the position field in the miniature copy corresponds to the position of the displayed portion of the large-size document in said large-size document.

9. A terminal according to claim 8, **characterized** in that the display means are arranged to display the position field in such a way that the ratio between the width and height of the position field is equal to the ratio between the width and height of the displayed portion of the large-size document

10. A terminal according to claim 8 or 9, **characterized** in that the control means are arranged to move the position field to any other position in the miniature copy by means of the pointer means, that the control means are arranged to register the new position of the position field, and that the display means are arranged to display on the small-size display the portion of the large-size document corresponding to the new position of the position field.

11. A terminal according to any of the claims 8-10, **characterized** in that the display means are arranged to display the position field on the small-size display with different transparency levels.

12. A terminal according to any of the previous claims, **characterized** in that the small-size display is a touch screen.

13. A terminal according to any of the previous claims, **characterized** in that the terminal is a telecommunication device.

14. A terminal according to claim 13, **characterized** in that the browser means are arranged to browse web pages on Internet.

ABSTRACT

A terminal for navigating documents, comprising browser means (1), pointer means (2) arranged to be controlled by a terminal user, a small-size display (3), and display means (4) arranged to display a portion of a large-size document on the small-size display (3), the area of the complete large-size document being larger than the area of the small-size display (3). The terminal comprises control means (5) arranged to form a miniature copy of the complete large-size document browsed by the browser means (1), and the display means (4) are arranged to display the miniature copy on the small-size display (3) in the form of a miniature field (6).

(Fig. 1)

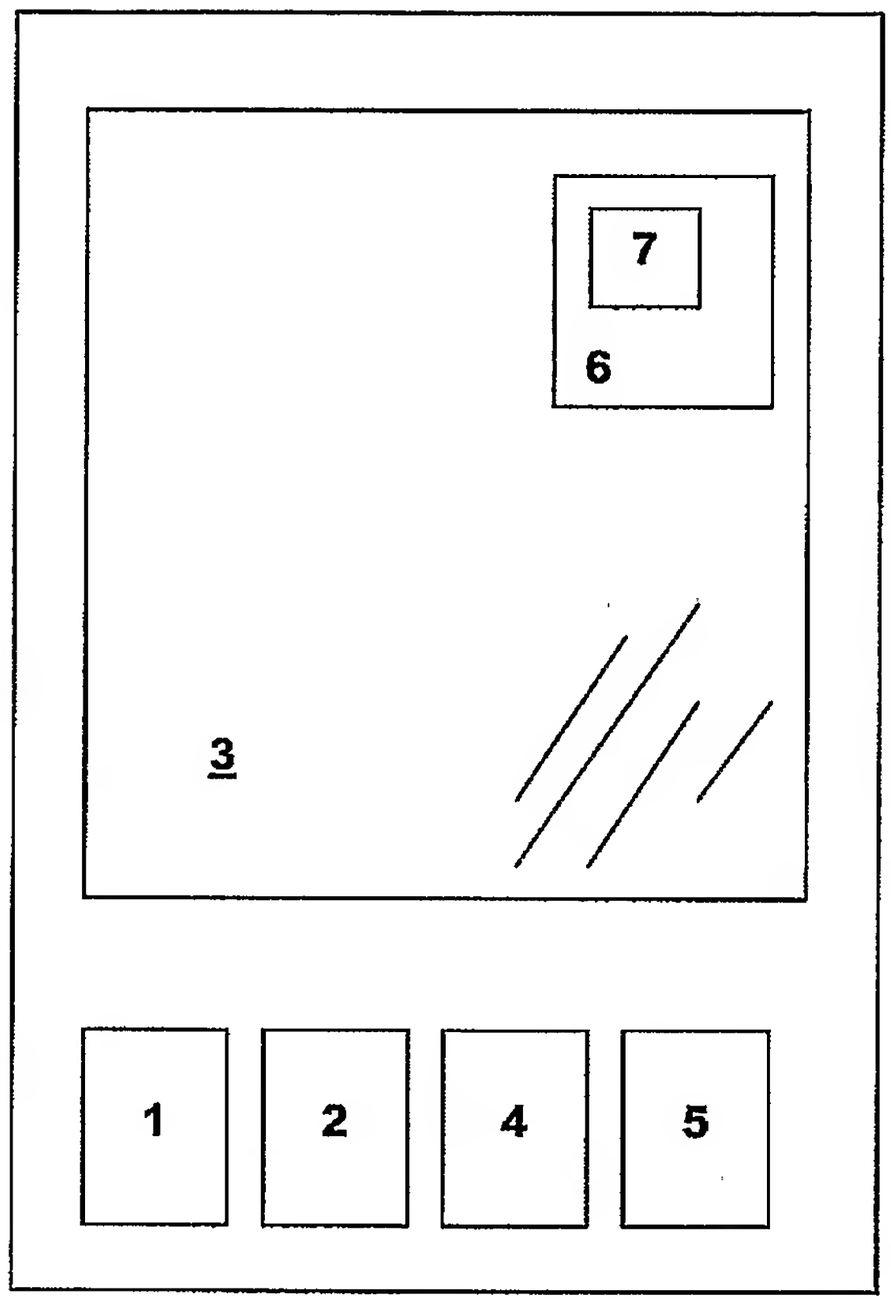

Fig.1

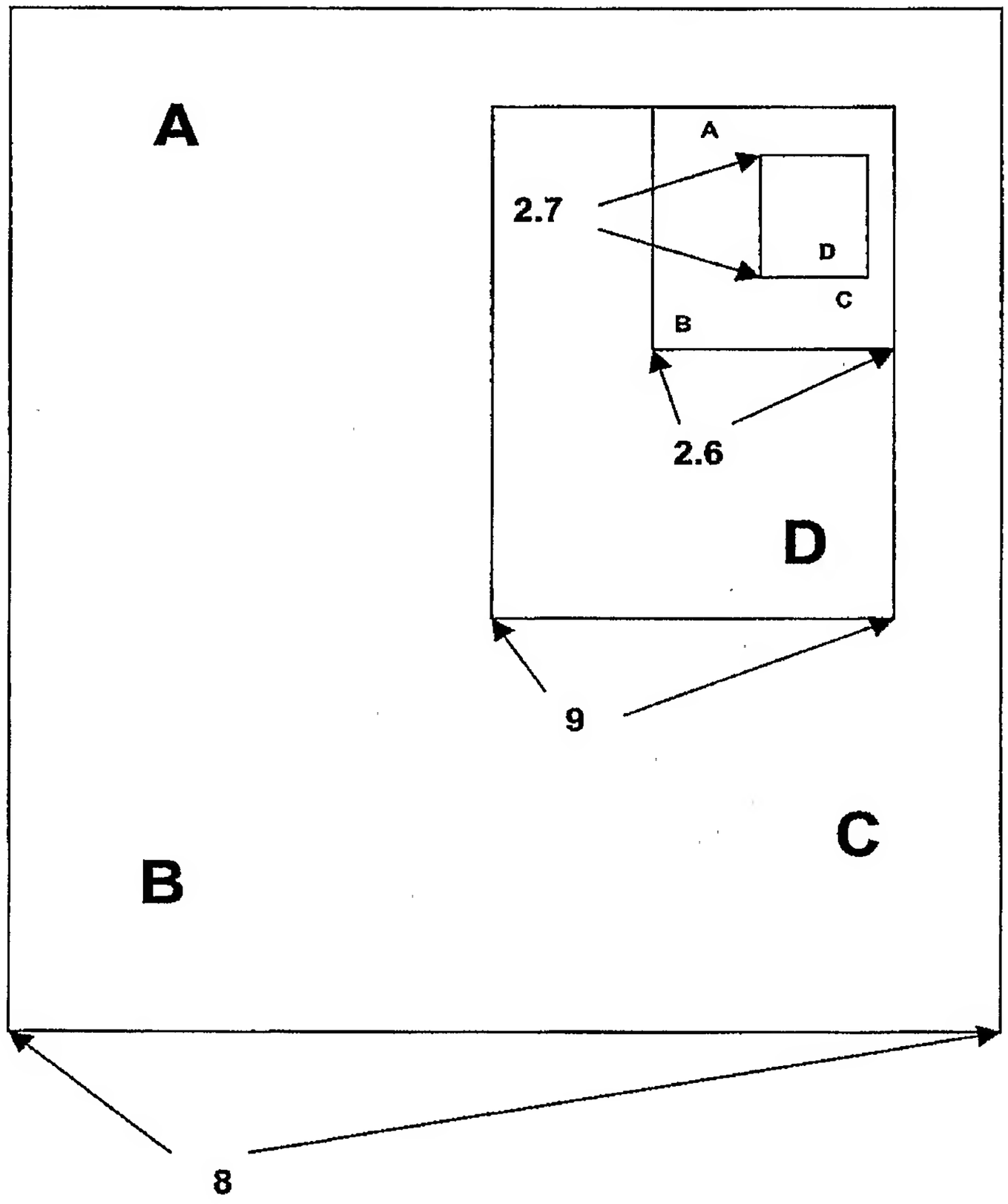

Fig. 2